

Understanding ISO's 9001 Benefits and Research through an Operations Strategy Framework

Borut Rusjan
Pavel Castka

Despite the success that the ISO 9001 standard has achieved it has been extensively criticized and empirical studies have shown controversial results about its impact on performance. Our conceptual study was motivated by the mentioned dilemma about ISO 9001 effectiveness, and the controversy that this dilemma raises in literature on the one hand and on the other by almost exponential growth of certifications among companies world-wide. It is our opinion that in order to understand results related to ISO 9001 implementation we need to take a step back from empirical research and instead try to analyze ISO conceptually by taking into account also the results of empirical studies implemented in the past. The purpose of the paper is to clarify the purpose of implementation of ISO 9001 and, in relation to this purpose, to analyze different possible benefits resulting from its implementation. In order to achieve this purpose our goal is to analyze the criticism of the old ISO 9001:1994 by using a specific framework of the operations strategy theory. The paper emphasises that in accordance with its conformance purpose, ISO 9001 is successful in building conformance capability and that by using ISO 9001 practices companies can also benefit in relation to production economics through improved process efficiency and to other competitive capabilities. It also emphasises that empirical results expected from ISO 9001 implementation are strategy contingent and therefore this should be taken into account in designing empirical studies about ISO's benefits.

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Introduction

Since its introduction in 1987, the ISO 9001 standard for quality management systems has made a huge imprint on global economy: there are one million firms certified by the standard, the standard has been adopted

Borut Rusjan is an Associate Professor at the Faculty of Economics, University of Ljubljana, Slovenia.

Pavel Castka is an Associate Professor at the College of Business and Economics, University of Canterbury, New Zealand.

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globally as well as in most industry sectors. The number of firms adopting the standard has been growing constantly and many firms still encourage their supply chain partners to seek certification. Therefore implementation of the ISO 9000 series probably represents one of the most widely used systems for achievement of transition towards improved organizational managerial systems. On its journey the standard has been revised three times – in 1994, 2000, 2008. Especially the 2000 revision was significant.

The literature review shows that the empirical research of implementation issues and results of ISO 9001:1994 has been extensive (for reviews of ISO 9001:1994 empirical research see for example Curkovic and Pagell, 1999; Santos and Escanciano 2002; Quazi et al. 2002; Angel R. Martínez-Lorente and Micaela Martínez-Costa 2004; van der Wiele et al. 2005). Despite the overwhelming popularity of ISO 9001:1994, there has been considerable confusion and frustration surrounding the role and business value of ISO 9000 certification (Terziovski, Samson, and Dow 1997). Additionally the ISO 9000:1994 model has received harsh criticism from the perspective imposed by the total quality management concept, and the literature identified several critical areas, requirements of a quality management system which were not included in the ISO 9000 requirements (Curkovic and Pagell 1999; Martinez-Lorente and Martinez-Costa 2004; Sroufe and Curkovic 2008). Empirical studies also researched the benefits and implementation problems of the new version of ISO 9001:2000 (Magd and Curry 2003; Biazzo and Bernardi 2003; Casadesus and Karapetrovic 2005; van der Wiele et al. 2005; Magd 2008; Feng and Terziovski, and Samson 2008), however the empirical research related to results of ISO 9001:2000 did not show a very optimistic picture either.

Singh (2008) claims that 'whilst popular, ISO 9000 is not beyond reproach. There is no clear-cut evidence of its effectiveness.' 'In general, studies investigating the effects of ISO 9000 on performance have shown mixed results' (Martinez-Costa, Martinez-Lorente, and Choi 2008), but more importantly ISO 9000 appears to selectively affect certain types of performance (Singh 2008). Especially empirical observation on the financial and business performance impact of ISO 9000 certification have yielded inconsistent results (Singh 2008; McGuire and Dilts 2008). This implies that there is a need for better understanding of the benefits that can be achieved through implementation of ISO 9000.

Our conceptual study was motivated by the above mentioned dilemma about ISO 9000 effectiveness, and the controversy that this dilemma

raises in literature on the one hand, and on the other hand with the almost exponential growth of certifications among companies world-wide. It is our opinion that, in order to understand results related to ISO 9001 implementation, we need to take a step back from empirical research and instead try to analyze the ISO conceptually by taking into account also the results of empirical studies implemented in the past. The purpose of the paper is to clarify the purpose of implementation of ISO 9001 and in relation to this purpose to analyze different possible benefits resulting from its implementation. In order to achieve this purpose our goal is to analyze the criticism of the old ISO 9001:1994 by using a specific framework of the operations strategy theory. This framework has been well defined and accepted within operations management research and therefore it has been used as a comparison basis within analysis of ISO 9001. Identification of problematic situations within analysis requires identification of an appropriate comparison basis. Justification for using operations strategy as a reference framework is presented in the analysis part of the paper.

The analysis draws upon a conceptual theoretical and empirical research base, developed within operations strategy research on the one hand, and on the other hand the paper also builds on an extensive empirical research basis related to implementation issues and benefits of ISO 9001:1994 and 2000.

The Journey from the 1994 Revision to 2000 Revision

The ISO 9000 quality assurance standards were first issued in 1987 and revised in 1994 by the International Organization for Standardization (ISO). Historically, ISO 9000 stemmed from the need to rationalize quality issues in contractual, business-to-business (or business-to-administration) relations (Conti 1999). Larson and Häversjö (2001) have pointed out that the standard with its origin in defence purchase had a clear focus on assuring that the company supplying the defence order was able to deliver. The supplier should study the order submitted ('contract review') and make sure that they understood and delivered as described. No more, no less. The initial aim behind the ISO 9000 series was to build confidence between suppliers and manufacturers in business-to-business transactions and in international trade (van der Wiele et al. 2005). Therefore, as Tummala and Tang (1996) clearly stated, there is one and only one core value for ISO 9001:1994, namely, conformance to specified requirements.

But besides this external benefit there has also been an important potential internal benefit for organizations that have implemented the standard. In its origin, ISO 9001 standard was also concerned with efficiency in an indirect way, by assuring deliveries as promised. By its emphasis on up-stream and in-process checks and by prevention it would help to reduce negative quality costs and in this partial way contributes to efficiency (Larson and Häversjö 2001).

But despite that, the ISO 9000:1994 version has been extensively criticized. First stream of criticism has been conceptual. Within this stream researchers identified deficiencies of ISO 9001:1994, mostly on the basis of its comparison with either the most important TQM elements or directly with quality awards models such as the Malcolm Baldrige Award Model and European Quality Award Model (Tummala and Tang 1996). Researchers that analyzed ISO 9000:1994 based on comparison with TQM mostly shared the view that ISO 9000:1994 certification's requirements represent the minimum common factor for any quality system (Santos and Escanciano 2002; Magd 2008), and as already explained it was considered as insufficient in relation to several critical areas:

- *Product quality*: Certification does not ensure that the product is of high quality, or attractive to the consumer (Curkovic and Pagell 1999; Santos and Escanciano 2002; Magd and Curry 2003).
- *Customer focus and competitive advantage*: the ISO series does not include a strong customer satisfaction and market focus (Curkovic and Pagell 1999; Santos and Escanciano 2002; Gotzamani, Theodorakioglou, and Tsiotras 2006; Sroufe and Curkovic 2008).
- *Continuous improvement*: ISO 9000 has limited focus on and does not explicitly support continuous improvement (Curkovic and Pagell 1999; Biazzo and Bernardi 2003; Martinez-Lorente and Martinez-Costa 2004; Sun et al. 2004; Gotzamani, Theodorakioglou, and Tsiotras 2006).

The second stream of criticism of ISO 9000:1994 has been related to empirical research showing that there is no clear empirical confirmation that ISO is improving company performance (Terziovski, Samson, and Dow 1997; Sun 2000; Singels, Ruel, and van de Water 2001; Santos and Escanciano 2002; Martinez-Costa and Martinez-Lorente 2007). Also this type of criticism has been related to lack of ISO implementation results based on the perspective of expected results from the implementation of a TQM system.

This criticism, based on the comparison of ISO and broader TQM approaches, seemed to have an important effect on the content of reformation of ISO standards, although some of the researchers emphasized that quality awards models (as representatives of broader TQM approaches) and ISO 9000 standards differ fundamentally in focus, purpose, and content and that companies should choose one or the other (Karthia 2004). Mostly, however, researchers were quite harmonious in evaluating revisions in the ISO 9000:2000 as a positive step in the right direction for solving/improving deficiencies discovered/embedded in the ISO 9000:1994 series. The prevalent opinion has been that the changes proposed were in areas that in particular would assist organizations to bridge the gap with TQM and to introduce more modern management practices (Biazzo and Bernardi 2003; Sun et al. 2004) so that quality assurance requirements and quality management aspirations can be aligned holistically (Boulter and Bendell 2002). The ISO 9000:2000 series are also formally based on a set of quality management principles, that are very much in line with the principles of TQM and the principles of the most popular quality and business excellence awards (Gotzamani 2005).

Most important changes, introduced in the ISO 9000:2000 versions, in adopting the TQM philosophy placed stronger emphasis on customer satisfaction and an effective process-oriented approach focusing on continual performance improvement (Franceschini, Galetto, and Cecconi 2006). Researchers claimed that in order to survive in the highest competitive business environment, the past approach of 'conformity to requirements,' which aimed at achieving customer satisfaction by preventing nonconformity, is not enough. Instead, a more proactive system, which is driven by 'customer satisfaction assurance,' should be introduced (Tsim, Yeung, and Leung 2002; Magd and Curry 2003; Gotzamani 2005; Franceschini, Galetto, and Cecconi 2006).

Operations Strategy Framework

It has been recognized that manufacturing activities could contribute a lot to business performance and this has been put to a posture of strategy – the operations strategy (Sun, Hong, 2002). Skinner (1969) is the pioneer in defining operations strategy. In his seminal articles Skinner (1969; 1974) emphasised the need to 'link' manufacturing decisions with overall corporate/business strategy and he developed the concept of internal and external consistency (Sun and Hong 2002; Boyer, Swink, and Rosenzweig 2005). Business strategy specifies the scope of each business

(the range of products and markets in which the company or business unit will compete) and defines the basis on which a business unit can achieve and maintain a competitive advantage within its industry (Rusjan 2005). Porter (1985) developed the idea that all competitive strategies are variants of generic strategies involving a choice between differentiation and delivered cost (price), with degree of focus, i. e., serving niche or broad markets, providing a second competitive dimension (Ward and Duray 2002).

Business strategy has to be supported by appropriate performance of all business functions. Operations strategy therefore studies what is the role of operations in achievement of competitive advantage. This is achieved through aligning capabilities of manufacturing with competitive requirements of the marketplace (Voss, 1995; Dangayach and Deshmukh 2001). Various authors in operations strategy literature have used different terms to describe such manufacturing capabilities, although they have most often been referred to as competitive priorities in case researchers meant intended capabilities, and as competitive capabilities in case researchers meant realized capabilities (Ward, Bickford, and Leong 1996). Despite differences in terminology, general agreement exists in the manufacturing literature about the dimensions of competitive capabilities or priorities that are generic in manufacturing, which normally include cost, flexibility (product mix and volume), quality (design and conformance), delivery (dependability and speed), and innovativeness (Flynn, Schroeder, and Sakakibara 1995; Dangayach and Deshmukh 2001; Swamidass, Darlow, and Baines 2001). There is an apparent relationship between Porter's types of competitive advantage and manufacturing competitive priorities.

Manufacturing attempts to achieve its competitive priorities (objectives) by formulating and implementing manufacturing strategy. In accordance with this, Maruckeck, Pannesi, and Anderson define operations strategy as a 'collective pattern of coordinated decisions that act upon the formulation, reformulation and deployment of manufacturing resources and provide a competitive advantage in support of the overall strategic initiative of the firm' (Maruckeck, Pannesi, and Anderson 1992). Most of the researchers give similar definitions (Dangayach and Deshmukh 2001). There is a general agreement about the strategic manufacturing decision areas in which capability-building program choices are made. Researchers agree about the set of strategic choices in manufacturing, which were placed into two groups, structural and infrastructural by

Hayes and Wheelwright (1984) (Dangayach and Deshmukh 2001; Boyer and Lewis 2002).

While the general framework for operations strategy is fairly well defined and accepted, debate continues over the relationship between competitive priorities. An important question associated with the alignment of operations capabilities with the business mode of competing, and the alignment of strategic decisions with operations priorities, is the question of the existence of trade-offs among capabilities, which implies that there is the need to trade-off between the various dimensions of manufacturing performance in order to best support the choice between cost leadership or differentiation (Porter 1985) formulated at business unit level (Dostaler 2001). This has been a major area of debate between the supporters of the proposition that trade-offs are necessary, versus supporters of a cumulative capabilities model specifying that capabilities can be complementary and built simultaneously over time (Boyer, Swink, and Rosenzweig 2005).

The important result of research related to competing views has been that the idea of the possible multiple positive impact of a given practice has become generally acceptable. Distinction between the trade-off and cumulative approach, after all, has not been as large as it might have seemed. It has been more a matter of the degree of extremity in the definitions. Therefore the actual question is not whether a trade-off or a cumulative approach is the right one, but with what activities and to what degree different capabilities can be cumulated (Flynn and Flynn 2004).

Analysis of Criticism of ISO 9000:1994 from operations Strategy Theory Perspective

We use the operations strategy framework as a basis for comparative analysis of ISO because of similarities between the two and because of their relationships. The purpose of ISO 9001:1994 has been clearly recognized as conformance, which represents one of the competitive priorities/capabilities emphasized within the operations strategy. From this perspective the old series of standards was congruent with the operations strategy framework. In fact, ISO actually nicely describes the logic of operations strategy. If the conformance is defined as strategic priority (either an order winner or a qualifier) within business strategy development, different activities have to be implemented in order to develop a certain level of this capability within different business functions of the company. The ISO quality system represents an example of a set of ac-

tivities that have to be implemented in order to achieve conformance capability. Therefore both the ISO and the operations strategy framework represent a rational, prescriptive, top down approach of decision making, with its emphasis on the formulation of plans for subsequent implementation.

The role of operations strategy is to support the implementation of business strategy through determining policies, and necessary activities within operations strategic decision areas. The role of ISO 9001:1994 has been similar, and consistent with this framework, however we can identify two differences between the two: the first difference was that ISO was narrower, as it had to provide practices needed only for the implementation of one of the competitive priorities, and the second that it was broader as – still in accordance with the logic of the operations strategy framework – it included not only activities within operations, but also other business functions. Therefore ISO developed activities that needed to be implemented within operations (and considering the analogy also within other business functions) in case business strategy identified conformance as an important competitive priority. So ISO 9001:2004 was taking care of the implementation part for one of the competitive priorities. Empirical research confirms that ISO has developed appropriate levers to build conformance capability (Sun 2000; Gotzamani and Tsiostras 2002). So the question is: why has ISO 9001:1994 received so much criticism?

Discussion Related to Conceptual Criticism of ISO 9001:1994

From the operations strategy framework it seems that most of the conceptual criticism of ISO 9000:1994 can be related to the definitional problems of quality brought up by Garvin (1984), Reeves and Bednar (1994) and associated multidimensionality of the quality concept (Garvin 1984). Garvin (1984) and Reeves and Bednar (1994) identified five approaches to defining quality, among which three were most commonly used by quality researchers and are also important for our research:

- The manufacturing-based approach defines quality as conformance to specifications. In the manufacturing-based approach, improving quality leads to lower costs, as preventing defects is viewed as less expensive than repairing or reworking them.
- In the user-based approach quality is defined as the extent to which a product satisfies the individual customer's wants, needs, and ex-

pectations. Firms can include numerous attributes and weights when trying to judge expectations.

- Value-based definitions emphasize that both price and quality have to be considered in a competitive market as consumption decisions which are based on both price and quality.

To overcome the conflicting definitions of quality, Garvin (1984) suggested an eight-dimensional framework for thinking about the basic elements of product quality: performance, features, reliability, conformance, durability, serviceability, aesthetics, and perceived quality. Researchers emphasized that continued inquiry and research into quality and quality-related issues must be built upon a thorough understanding of differing definitions of the construct (Reeves and Bednar 1994). This is important because provision of different quality dimensions poses different demands on different organizational functions (e.g. marketing, design, manufacturing, purchasing) and may require different organizational practices depending on the quality dimension in question (Flynn, Schroeder, and Sakakibara 1995). Why is this important for analyzing the conceptual criticism of ISO?

If we look into conceptual criticism of ISO 9001:1994 from the operations strategy theory framework, we see that ISO has mostly been criticized for doing exactly what it was supposed to do, i. e. providing appropriate levers for building conformance capability. Conceptual criticism that ISO 9001:1994 did not provide high quality of the product or assure that the product would be attractive to the consumer (Curkovic and Pagell 1999; Tummala and Tang 1996; Magd and Curry 2003) is related to the misinterpretations of the ISO's purpose and role. Criticism that ISO did not provide product quality is based on neglect of the multidimensionality of quality concept. Researchers did not use an appropriate definition of quality, and they based their criticism on interchanging two dimensions of quality, conformance to specifications and product performance (design quality).

We emphasized that the original purpose of ISO 9000 standard procedures has been to guarantee, that products meet agreed customers requirements. Therefore the ISO 9000:1994 standard represented a specific decision making process which had a specific and clear purpose to ensure a supplier's conformance to specified requirements. It is important to notice that the standard's goal has not been the determination of the appropriate level of product and service technical requirements.

The level of technical sophistication had to be determined beforehand in some other decision making process, and technical specification represented an input into the ISO 9001:1994 quality system. In accordance with its purpose, the standard appropriately completed its goal to determine and describe different levers that have to be developed, established, instituted, and emphasized within the company in order to achieve the conformance purpose. Researchers and ISO itself emphasised that quality system requirements specified in the ISO standards were considered complementary to technical product and service requirements (Tummala and Tang 1996; Kartha 2004; Van der Wiele et al. 2005). What this actually meant was that the level of the product quality was external to ISO.

What should product characteristics be, or what level of product quality do we want to achieve, or which customers are the right ones to negotiate requirements with, as they belong to the company's target customer group, is something that has to be determined within business strategy based on market segmentation and on targeting the appropriate customer group. Regardless of what desired level of product quality has been determined within business strategy, ISO has to achieve conformance to specifications. This is valid even though the company does not compete on the high quality of its products. Therefore researchers were right that compliance to the standards did not necessarily prevent an organization from producing 'poor-quality' products (Kartha 2004). But the reason for this has been that the level of product quality was external to ISO as it has been determined within business strategy. The goal of ISO has not been to determine the desired level of product quality and to provide levers needed to improve product quality. As mentioned above, the achievement of capability related to this quality dimension would usually require different activities.

In relation to ISO's focus on conformance to specification, researchers often inappropriately concluded that a certification's requirements represent the minimum common factor for any quality system focusing on process rather than product/service quality (Gavin, Gallimore, and Brown 2002; Van der Wiele et al. 2005; Magd 2008). We said inappropriately, because ISO does not represent a minimum, we could even say it represents a maximum for assurance of conformance capability. The ISO system is a quality system, which is well designed in accordance with its conformance purpose, however it is not a system for the improvement of product quality, and has never meant to be. But describing ISO as a

minimum characteristics quality system shows that researchers viewed ISO as being too narrow, although it was fulfilling its purpose.

Researchers emphasised the need for a broader view of ISO when they were referring to customer focus and customer satisfaction. In fact they explicitly criticised ISO for being too narrow, and not have been customer focused. As Reeves and Bednar (1994) pointed out, the major advocates (Crosby, Deming, Feigenbaum, and Juran) of a conformance-to-specifications definition of quality stressed that customers' wants must be the driving force of specifications that are established. So the standard was customer focused. They also claimed that if customers' needs are governed by specific requirements or standards, as they would be for many industrial customers, conformance to specifications is the most objective, appropriate, and easily measured definition of quality. However this definition might be problematic for services, since 'when specifications cannot be established or conformance to them actually detracts from the quality of the service, defining quality as conformance to specifications results in lower, not higher, quality' (Reeves and Bednar 1994). Another problem is that many if not most consumer goods are not evaluated in terms of conformance to specifications. As ISO has been expanding also into consumer goods industries and services, the conformance quality definition began to seem narrow, and the focus on customer need started.

By looking into the emphasis on satisfying customer needs from the point of view of approaches to quality definitions mentioned above, we can see that criticism of the lack of customer focus really represented a change in approach to quality definition. Researchers made a shift from the manufacturing-based towards the user-based definition. But what does this change in the definition of quality mean if we look into it from the perspective of the operations strategy framework? It means that the focus is broadened, including not only conformance priorities but also other operations strategic priorities (Curkovic and Pagell 1999). Sun, for example, points out that in Japan and other countries, 'quality circle' is still termed 'quality circle' although it may deal with cost, delivery and service problems, and that this does not imply that quality is 'dead,' but that all other performance factors such as productivity, flexibility, delivery and innovation are alive (Sun et al. 2004).

From this perspective of change in the definition of quality also other types of conceptual criticism of ISO 9001:1994 become clear, and can be similarly dismissed as they are based on the change of quality definition,

and therefore deny ISO's original purpose. We can see that the fact that ISO 9001:1994 limited itself to serving as a base for continuous improvement, understood as a continuous reduction of non-conformities was in accordance with its purpose. As mentioned, ISO represented a consistent decision making cycle with its specific purpose, and therefore this decision cycle could not primarily provide continuous improvement related to other purposes.

It is commonly accepted among quality researchers that quality must be defined by the customer, and therefore all product or service attributes that contribute value to the customer and lead to customer satisfaction need to be addressed. Consequentially the simple and internally oriented requirements of the ISO 9001 standard received serious doubts and criticism as to the extent to which they could guarantee quality through customer satisfaction. Our analysis showed that ISO 9001 can contribute to customer satisfaction through achievement and continuous improvement of product conformance (and associated benefits discussed in the next section) in accordance with the manufacturing-based definition of quality, however it can't contribute to customer satisfaction through achievement and improvement of product performance (design quality) in accordance with the user-based definition of quality.

Discussion Related to Empirical Research Criticism of ISO 9001:1994 Results

Regarding the criticism in empirical research, it seems that it is mostly based on neglecting the theoretical base of possible impacts of activities implemented within the ISO system. The problem was that design of the research often has not been based on the theoretical basis that could be drawn from the operations strategy literature. If we take into account the operations strategy framework, empirical studies should search for the direct impact of ISO practices on different capabilities. Although ISO's basic purpose was identified as conformance, this does not mean that activities implemented within the ISO system could not improve also other capabilities. In fact they do, and there is a conceptual theoretical explanation for that, as well as empirical confirmation. Based on the cumulative capabilities approach it is generally accepted within operations strategy that specific practices can have positive effects on different capabilities. Also most of the cumulative capabilities models have emphasized that quality activities represent the basis for the build up of other capabilities (Flynn and Flynn 2004). Garvin (1984) developed a theoretical base

from which it can be implied that ISO practices could affect not only conformance, but also efficiency and productivity, and that conformance capability is also usually positively related to some other dimensions of quality.

Most of the empirical research that studied ISO benefits has identified a positive impact on what researchers usually called internal efficiency, which include: clearer definition of their processes and responsibilities that have resulted in reduction in product defects, rejections and claims; reduction in rework and warranty cost (Sun 2000; Santos and Estanciano 2002; Gotzamani and Tsiotras 2002). On the other hand we found only one empirical study which tried to identify the impact of ISO on different dimensions of quality. Based on case analysis of 11 European companies, Withers and Ebrahimpour (2000) found out that ISO often had a positive impact not only on conformance, but also on perceived quality, serviceability, and reliability as well, in case these presented order winners for companies. On the other hand, the results showed moderate or null impact on performance, features, and aesthetics dimensions. These results confirm our discussion related to the impact of ISO 9001 on product performance (product design) in the previous section.

Therefore there is a theoretical foundation, as well as empirical confirmation, that implementation of ISO 9001 practices has a simultaneous positive impact on different competitive capabilities in accordance with the cumulative capabilities framework. This was probably one of the important reasons why ISO has gained such popularity and has been so widely introduced globally. But on the other hand, research identified also some trade-off characteristics of implemented ISO activities. Researchers mostly identified trade-off impacts associated with ISO implementation on flexibility capability. Implementation of the standards may result in the development of a static quality system that increases bureaucracy and reduces flexibility and innovation (Fuentes et al. 2000; Martinez-Lorente and Martinez-Costa 2004; Gotzamani, Theodorakioglou, and Tsiotras 2006). Loss of flexibility and the rigid documentation may tend to hamper the ability of a company to change quickly (Tsim et al. 2002).

More problematic from the point of view of considering the theoretical base of possible impacts of activities implemented within the ISO system, were studies that were analyzing effects of ISO on competitive advantage, customer satisfaction, increased sales, company's financial performance, and similar. These studies often found that ISO did

not have an important impact, but mostly showed controversial results (Martinez-Costa and Martinez-Lorente 2007). The studies mostly tried to identify the direct impact of ISO introduction on the mentioned performance measures. Rarely have studies used moderating variables, for example Terziovski, Samson, and Dow (1997) used 'strong' and 'weak' TQM environment as a moderating variable. Based on the operations strategy framework studies should have taken into account strategy as a moderating, control variable or mediating variable, when trying to identify such impacts. From the operations strategy perspective it is clear that conformance capability which is the purpose of ISO, represents only one element of a company's competitiveness. And regarding the company's competitiveness, conformance could either have the role of order winner, and in this case represent an element of competitive advantage, or else it could have the role of a qualifier (Hill 1994). However as mentioned above, ISO practices affect different competitive capabilities, and through them they also can have an impact on competitive advantage, customer satisfaction, sales, and profitability. But what this impact would be depends on the competitive strategy of the company, i. e. whether conformance and other capabilities on which ISO implementation had an effect represent order winners or qualifiers within the company. Each of the possible situations would lead to different consequences regarding ISO's impact.

Within operations strategy research different authors have studied the impact of quality practices on company performance, however they took the operations strategy framework into account (Flynn, Schroeder, and Sakakibara 1995; Fynes and Voss 2001). Research by Flynn et al. shows that competitive advantage is a multifaceted construct, and that besides quality there are other factors that contribute to competitive advantage. This suggests that focusing solely on quality improvement may not be a sufficient means for a plant to attain and sustain a competitive position. A study done by Fynes and Voss showed that there is no evidence to support the proposition that improved quality performance is positively related to improved overall business performance, which was contrary to the results of PIMS (Profit Impact of Market Strategies) studies that provided support for the relationship between product quality and firm performance. They explained this with an argument that in many marketplaces, the role of quality performance has changed from that of order-winner to order-qualifier, and as such is a necessary but not sufficient contributor to overall business performance, and there-

fore the contribution of quality performance to business performance may have changed. We claim that research studies of ISO benefits should follow approaches similar to those used by authors in operations strategy research to identify the results of ISO implementation. They should take into account that the basic purpose of ISO 9001 is conformance, and that conformance represents just one element of the quality dimensions and just one among many possible differentiators that a company could choose from in the attempt to achieve a competitive advantage.

The view that competitive strategy should be used as a moderating variable is also indirectly supported by the results of empirical research studying ISO benefits. Empirical research has shown that so called external benefits of ISO implementation changed in time. Santos and Estanciano (2002) noted in their study that other benefits of a clearly commercial nature, such as 'sales increase,' 'market share increase' and 'export increase,' which was considered to be the most important in the oldest studies, received the lowest benefits score. This can be related to other studies which claimed that conformance in the early eighties represented an order winner, but later rather became a qualifier (Garvin 1984; Flynn, Schroeder, and Sakakibara 1995; Fynes and Voss 2001; Sroufa and Curkovic 2008).

That ISO 9001 has generally been accepted as a qualifier in the modern business setting (Terziovski, Samson, and Dow 1997; Fuentes et al. 2000; Douglas, Coleman, and Oddy 2003; Sroufa and Curkovic 2008), is, besides the cumulative capabilities characteristics of activities implemented within ISO, that we already mentioned, probably the second reason for such a wide implementation of ISO globally. Garvin (1984) argued that conformance is a more objective measure of quality, because virtually all users regard it as desirable. If we consider that conformance represents a qualifier it also becomes understandable that its impact on competitiveness, customer satisfaction and company performance will not be of high importance. Therefore the strategic contingency in ISO implementation might explain the controversies in empirical results about ISO benefits.

In fact empirical research of ISO benefits implicitly acknowledged strategy contingency. However they did this indirectly, as empirical research identified motivation for ISO implementation as an important factor determining ISO implementation benefits. Motivation for ISO implementation can be interpreted as strategy contingency based. We explained that in accordance with the operations strategy framework

companies will introduce ISO either because conformance is an order winner, or because it is a qualifier. Regarding the motivation of the introduction of ISO 9001, the literature recognizes two groups of imperatives: external or market driven imperatives and internally- or improvement driven reasons (Martínez-Costa and Martínez-Lorente 2007). It can be implied that in case companies are externally pressured to introduce of ISO, conformance represents a qualifier, and when companies wanted to improve processes and internal efficiency, conformance represents an order winner. Empirical research shows that companies with internal motivation for the implementation of ISO achieved better performance results, while companies that introduced ISO based on external pressure, on the other hand, achieved lower performance results (Huang, Horng, and Chen 1999; Singels, Ruel, and van de Water 2001; Heras, Dick, and Casadesus 2002; Llopis and Tari 2003; Terziovski, Samson, and Dow 1997; Arauz and Suzuki 2004).

We can conclude that, although unwillingly, as instead they were searching for results that could not be (or at least only by taking contingencies into account) conceptually contributed to ISO 9001 implementation, researchers were actually confirming that the ISO based quality system has been appropriately functioning for achieving the purpose for which ISO standard has been designed. Although the results lead to researchers' criticism of ISO, they in fact confirmed that the levers included into ISO requirements were the right ones as they improved conformance and contributed to associated gains in efficiency.

Conclusion

The paper has analysed the ISO 9001 system using the operations strategy framework for a basis comparison. Similarities between the two enabled us to clearly define the purpose of the ISO 9001 system and the scope of its possible results. This is important both, for practitioners, as well as for researchers.

Empirical research confirms that, in accordance with its conformance purpose, ISO 9001 is successful in building conformance capability and that by using ISO 9001 practices companies can also benefit in relation to production economics through improved process efficiency, and also to other competitive capabilities. On the other hand practitioners cannot expect ISO to improve the level of product quality, and consecutively provide associated customer satisfaction and continuous improvement. Improving the level of product quality is not within the scope of ISO

9001; instead it has to be determined within the process of developing business strategy.

Therefore all requirements of ISO 9001 have to be interpreted in relation to product conformance. For example, in monitoring performance through measuring customer satisfaction within ISO requirements we should only measure whether we achieved product conformance (for example by collecting data about customer complaints) or satisfaction of the customer by our meeting product specifications. If conformance to specifications was achieved to a certain degree, the ISO system worked well. Therefore the customer satisfaction measurement within ISO 9001 cannot measure customer satisfaction in general, because the general goal of achieving customer satisfaction is based on the achievement of different capabilities – which are part of another (and broader) business strategy decision making process.

By looking into ISO 9001 from the point of view of the operations strategy framework, we could also better understand the expected scope of empirical results. We emphasised that empirical results expected from ISO 9001 implementation are strategy contingent and therefore this should be taken into account in designing empirical studies about ISO's benefits. The impact of ISO 9001 on competitive advantage, sales and profitability depends on the role of conformance and other capabilities affected by ISO implementation within a company's strategy. An important impact can be expected in case conformance and other capabilities affected by ISO implementation represent order winners of the company.

The old ISO 9001 has been mostly criticized regarding its lack of customer focus, however the paper showed that this criticism has in fact been based on a user-based definition of quality, where ISO 9001 has actually been correctly implemented following the manufacturing-based definition. Taking this into account, it became clear that is not true that relation with customers did not exist in the previous version of ISO 9001, in fact originally in ISO the specifications were given by the customer. They were based on a contract between the company and the specific customer. With the new emphasis on customer satisfaction the purpose of ISO 9001 could switch from conformity to competitiveness. So the question then arises, whether ISO should become the standard of strategy implementation instead of the standard for assurance of meeting product specifications.

We showed that such expectations of ISO were based on interchanging two definitions of quality. Changing from a conformance-based ap-

proach to a user-base approach can be understood from the point of view of needs of service and consumer goods industries. However such a change in the purpose of ISO 9001 would mean that its focus is broadened, and therefore ISO would also have to introduce new levers needed for achievement of other capabilities. Changing the purpose of ISO to resolve problems related to these industries therefore is not an appropriate solution. Instead of broadening the purpose of the standard, we should search for new approaches as to how ISO 9001 requirements for conformance could be improved in the case of the consumer products and services. In consumer markets the customer might not be able to express his/her needs directly, therefore the question of whether customer needs have been properly included into product specifications becomes important. Maybe ISO could include requirements that would confirm that target customer groups have been appropriately determined and that their requirements have been appropriately translated to product specifications (for example through use of the QFD method). Determination of specifications in the service setting is also difficult because of their characteristics. Application of existing and new research for the purpose of standardization and certification is needed, both for consumer markets and for services in order to help determine approaches for product/services characteristics, and conformance policies.

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